

REMARKS

Claim 1 is amended by incorporating the subject matter of claim 5. Claim 5 is canceled.

The specification and claims are also amended to correct a translation error by replacing the term “angle” with the term “square”. Applicants respectfully submit that the word in Japanese (a Chinese character) corresponding to “square” is the same word as “angle”. See, e. g. page 687 of Kenkyusha’s New Japanese-English dictionary attached hereto, item 2 under kaku “a square”, “a board five inches square”, etc. Therefore, the term “angle” is mistakenly used instead of “square” throughout the application. However, Applicants respectfully submit that, for example, from the context in which the term “90 µm angle” is used in the specification, one of ordinary skill in the art would not only recognize the existence of error in the specification, but also recognize that replacing the term “90 µm angle” with “90 µm square” is appropriate to correct the obvious error.

Applicants also submit herewith a corrected Sworn English Translation of JP 2002-241581 with the term “angle” replaced by “square” for the record.

Accordingly, Applicants’ respectfully request entry of the Amendment.

I. Response to Claim Rejections Under 35 U.S.C. § 102

A. Mizushima et al

In Paragraph No. 4, claims 1, 3, 4 and 8-17 are rejected under 35 U.S.C. § 102(b) as allegedly being fully anticipated by Mizushima et al (hereinafter “Mizushima”).

Independent claim 1 is amended by incorporating the subject matter of claim 5, which is not disclosed, taught or suggested by Mizushima. That is, Mizushima does not disclose, teach or

suggest at least the element of the substrate including a pre-groove having a track pitch of 200-400 nm and a groove depth of 20 to 150 nm. For at least this reason, the presently claimed invention is not anticipated by Mizushima. Claims 3, 4 and 8-17 are dependent thereon and are distinguished for at least the same reason.

Accordingly, Applicants respectfully request withdrawal of the §102 rejection.

B. Miki

In Paragraph No. 5, claims 1, 3, 4 and 8-16 are rejected under 35 U.S.C. § 102(b) as allegedly being fully anticipated by Miki.

Independent claim 1 is amended by incorporating the subject matter of claim 5, which is not disclosed, taught or suggested by Miki. That is, Miki does not disclose, teach or suggest at least the element of the substrate including a pre-groove having a track pitch of 200-400 nm and a groove depth of 20 to 150 nm. For at least this reason, the presently claimed invention is not anticipated by Miki. Claims 3, 4 and 8-16 are dependent thereon and are distinguished for at least the same reason.

Accordingly, Applicants respectfully request withdrawal of the §102 rejection.

C. Ohno

In Paragraph No. 6, claims 1, 3, 4 and 8-16 are rejected under 35 U.S.C. § 102(b) as allegedly being fully anticipated by Ohno.

Independent claim 1 is amended by incorporating the subject matter of claim 5, which is not disclosed, taught or suggested by Ohno. That is, Ohno does not disclose, teach or suggest at

least the element of the substrate including a pre-groove having a track pitch of 200-400 nm and a groove depth of 20 to 150 nm. For at least this reason, the presently claimed invention is not anticipated by Ohno. Claims 3, 4 and 8-16 are dependent thereon and are distinguished for at least the same reason.

Accordingly, Applicants respectfully request withdrawal of the §102 rejection.

II. Response to Claim Rejections Under 35 U.S.C. § 103

A. Either Ohno or Mizushima in view of Ohkubo and Yabe et al

In Paragraph No. 7, claims 1-17 are rejected under 35 U.S.C. § 103(a) as being unpatentable over either Ohno or Mizushima in view of Ohkubo and Yabe et al (hereinafter “Yabe”).

Applicants respectfully traverse the rejection.

As stated above neither of Ohno nor Mizushima discloses, teaches or suggests at least the element of the substrate including a pre-groove having a track pitch of 200-400 nm and a groove depth of 20 to 150 nm.

Further, there is no motivation for one of ordinary skill in the art to combine Ohno or Mizushima in view of Ohkubo and Yabe et al with a reasonable expectation of success.

Ohno discloses that the size of the recesses and protrusions on the reflective layer surface affects optical properties. Ohno also teaches that it is important (see lines 3 and 4 of [0035] of Ohno) that the size of recesses and protrusions is relative to the crystal grain size, and that if the crystal grain size of the metal forming the reflective layer is fine and uniform, there is no problem that noise becomes large at the time of recording or reproducing (see [0034]

to [0036] of Ohno). In Ohno, the size of recesses and protrusions is calculated from the data obtained by using an atomic force microscope (AFM) (see [101] of Ohno) and Ohno discloses the comparative data using thus obtained values.

Ohno proposes, for forming a reflective layer of which the crystal grain size is fine and uniform, a method including forming an underlayer which is not crystalline but amorphous and forming a metal reflective layer on the underlayer (see [0037] and subsequent paragraphs of Ohno).

In Mizushima et al, it is described that JP-A 120613/1999 discloses that “morphology of the boundary (viz., the interface between the recording layer and the reflective layer) reflects the grain size determined by the crystallinity of the reflective layer” (see [0013] of Mizushima et al). In Mizushima et al it is also described that an excessive reduction in the grain size results in various problems (see [0015] of Mizushima et al). Further, Mizushima et al discloses that it is important to set the crystallite size of the reflective layer up to 30 nm and provides detailed data in Table 2. The crystallite size is measured using an X-ray diffractometer (see [0082] of Mizushima et al).

When comparing the disclosure of Ohno et al and that of Mizushima et al as indicated above, it is understood that Mizushima et al demonstrates that an optical recording medium of low noise cannot always be obtained even though a reflective layer where the crystal grain size is fine and uniform is formed and the size of recesses and protrusions is small. That is, Mizushima et al indicates that the crystallite size is more important than an average grain size as a factor relating to noise.

This fact shows that the optical recording medium of low noise cannot always be obtained when the size of recesses and protrusions becomes low and Ra is 4 nm or less as disclosed in Ohno.

In the present invention, it was found that the number of projections having a height from a reference plane of 50 nm or greater greatly affects noise. It was also found that when the number of projections having a height from a reference plane of 50 nm or greater exceeds 30 (number/90 μ m square) or less, it is possible to greatly reduce the noise of the optical recording medium.

Neither Ohno nor Mizushima et al disclose, teach or even recognize the importance of these features of the present invention. Ohkubo et al and Yabe et al fail to remedy the deficiencies of Ohno and Mizushima et al.

Ohkubo et al just mentions a "reflection layer" and does not provide a description of it. Thus, although Ohkubo describes numerical values of the track pitch and the depth of the groove of the substrate, Ohkubo et al does not describe the reflective layer in sufficient detail.

Also, there is no description of a reflective layer in Yabe et al. Yabe is cited against claim 2. However, even if Yabe et al is combined with other references, the patentability of the present invention cannot be denied since claim 1 of the present invention is patentable.

Therefore, it is clear that, even if any one of Ohno or Mizushima et al is combined with the secondary references (Ohkubo et al. (US 6,590,857) and Yabe et al. (US 4,731,620), one of ordinary skill in the art cannot arrive at the present invention and the effect obtained by the present invention cannot be expected.

Accordingly, the present invention is patentable over the cited references.

B. Ohno in view of Kawakubo

In Paragraph No. 8, claims 1, 3, 4, and 8-20 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Ohno and over Kawakubo.

Ohno fails to disclose, teach or suggest all elements of the present invention, for the reasons set forth above. Kawakubo et al '656 also fails to disclose, teach or suggest the projections and SRa value recited in the present claims and therefore does not remedy the deficiencies of Ohno. Thus, the cited references, whether taken alone or in combination, do not teach or suggest all elements of the present invention and even if combined the present invention would not have been obtained.

Accordingly, Applicants respectfully withdrawal of the §103 rejection.

C. Ohno in view of Kawakubo further in view of Ohkubo et al and Yabe

In Paragraph No. 9, claims 1-20 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Ohno in view of Kawakubo, further in view of Ohkubo et al (hereinafter "Ohkubo") and Yabe.

Ohno and Kawakubo et al fail to disclose, teach or suggest all elements of the present invention, for the reasons set forth above. Ohkubo et al and Yabe et al also fail to disclose, teach or suggest the projections and SRa value recited in the present claims and therefore do not remedy the deficiencies of Ohno and Kawakubo et al. Thus, the cited references, whether taken alone or in combination, do not teach or suggest all elements of the present invention and even if combined the present invention would not have been obtained.

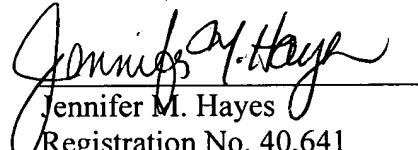
Accordingly, Applicants respectfully withdrawal of the §103 rejection.

III. Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

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